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GENERAL REPORT OF AN EXAMINATION OF 415 YOUNG DEAF-MUTES, IN REGARD TO THE NASAL CHAMBERS, EARS, AND ORGANS OF PHONATION.

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GENERAL REPORT OF AN EXAMINATION OF 415 YOUNG DEAF-MUTES, IN REGARD TO THE NASAL CHAMBERS, EARS, AND ORGANS OF PHONATION.

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DURING the past year I made a careful examination of the aural, throat, and nasal conditions of 415 deaf-mute children, inmates of the Pennsylvania Institution for the Education of the Deaf and Dumb.

The cases thus examined may be divided into three groups, the first being the pupils of the sign department, whose education has been conducted entirely by means of the "sign language," and with whom there has been no attempt made at oral training. Of the 415 pupils examined, 303 belong to this group of "signers." Group 2 is composed of pupils of the oral department, whose training is strictly oral, the aim being to enable the pupil to use and understand verbal language. Of the total number examined, 91 pupils belong to this group of "orals." Group 3 is made up of pupils who have been given a trial in the oral department, but, failing to succeed in this system, have been sent to the sign department, the attempt at oral training being abandoned. Of the 415 pupils 21 belong to this group of *oral failures*.

	Group 1.	Group 2.	Group 3	Total.
NARES.				
Deformities, consisting of deviated septa, exostoses, hypertrophied turbinals, causing partial or complete occlusion of one or both nares . .	65	14	4	83
Posterior hypertrophies of turbinals	21	1	2	24
Impactions of middle turbinals against the septum	14	3	0	17
Synechial bands between the septum and lower turbinals	2	2	0	4
Sclerosis of mucous membrane in the anterior nares	35	7	5	47
Sclerosis in posterior nares . . .	13	8	0	21
Atrophy of nasal mucous membrane	20	2	0	22
General catarrhal condition due to vasomotor paresis without deformities	13	3	0	16
Adenoids in vault of pharynx, causing partial occlusion of this space or pressure upon the Eustachian openings	57	14	8[4]	79
TONGUE.				
The frenum was abnormally short .	24	0	1	25
Hypertrophy of the lingual tonsil worthy of note	12[1]	1	0	13
PALATE.				
Abnormally high, narrow, and gothic-arched	8	0	2	10
Deflection of raphé from median line, most frequently to left side .	6	0	0	6
Double uvula	2	0	0	2
Relaxed and pendulous soft palate	2	0	0	2
TONSILS.				
Large tonsils which filled the spaces between the faucial pillars of their own sides of the throat, but were not adherent to these bands, or did not cause serious occlusion or pressure upon surrounding parts .	32	16	1	49

[1] Six of these were in pupils between 14 and 22 years old; the other six in pupils under fourteen years of age.

	Group 1.	Group 2.	Group 3.	Total.
TONSILS.				
Tonsils greatly hypertrophied, diseased, and causing pressure upon palate or tongue, and greatly occluding the faucial space . . .	18	5	4	27
Adhesion between tonsil and faucial pillars, the tonsil being encapsulated	30	6	5	41
Narrowing of fauces by broad posterior pillars with high attachment to the pharyngeal walls	11	0	0	11
PHARYNX.				
Simple hypertrophy of mucous follicles	23	3	2	28
Sclerosis of mucous membrane with follicular hypertrophy	9	6	0	15
Simple sclerosis of mucous membrane	55	20	5	80
Atrophy of mucous membrane . .	8	1	1	10
Venous engorgement worthy of note	22	2	3	27
LARYNX.				
Epiglottis abnormally depressed .	14[2]	2	0	16
"Infantile" epiglottis	2[3]	0	0	2
VOCAL BANDS.				
Apparently normal in color and ordinary movement	83	63	12	158

In considering the general results of examinations, only decided pathologic conditions will be considered in this paper. The detailed account of each case will be prepared and published at a

[2] Only four being in pupils under fourteen years of age.

[3] Both being in pupils over fourteen years of age.

[4] These eight cases all occurred in subjects between twelve and nineteen years old.

later date. The mere enumeration of lesions is of general interest, but, to estimate the importance of such lesions in their influence on the training and education of the pupil, the reader must know what relations these bear to all the parts involved in phonation. In short, the report of conditions found in the nose, post-nares, pharynx, tongue, palate, tonsils, larynx, and ears, in each individual pupil, must be tabulated and put in form for easy reference. This will be done at a future date.

Most of the pupils of group 1 presented vocabands of a dull-gray color, bowing or wavy at their free margins, or so thin and narrow as to be unusually obscured by the ventricular bands. Efforts at phonation showed the adducting muscles to be weak and inefficient.

EARS.

The limits of this paper will not permit of more than a general enumeration of gross lesions. The majority of pupils presented drum-heads that were retracted, dull in color, and feebly movable. These will not be noted here, but only such cases of plastic otitis media as displayed adhesion of the drum-head, in whole or in part, or other destructive process. It is left for the detailed report to give the aural condition in each individual pupil.

	Group 1.	Group 2.	Group 3.	Total.
Plastic otitis media, limited as already explained	75	20	16	111
Adherent and immovable drum-heads	94	28	3	125
Very feebly movable drum-heads	43	12	4	59
Atrophic drum-heads	2	0	0	2
Engorgement of manubrial vessels and pinkish tint of drum-head	6	3	1	10
Calcareous deposits in drum-head	14	2	0	16
Double perforations with otorrhea	9	5	3	17
Single perforations with otorrhea	10	5	1	16
Cicatrized perforations, many of them covered with new membrane	32	13	3	48
Double impactions of cerumen	14	5	0	19
Single impactions of cerumen	15	7	2	24
Atresia of external auditory meatus	2	0	0	2
Undeveloped auricles with absence of auditory meatus	1	0	0	1
Foreign bodies	6[1]	0	0	6
Desquamative otitis externa	4	0	0	4
HEARING.				
A slight trace of hearing	6	17	2	25
On contact only	62	6	10	78
Fair hearing	0	2	0	2

PERSONAL AND FAMILY HISTORY.

Origin of Deaf-mutism.	Group 1.	Group 2.	Group 3.	Total.
(*a*) From birth	105	22	10	137
(*b*) Acquired	178	65	11	254
(*c*) Uncertain	20	4	0	24

[1] Consisted of cotton, stick of wood, paper, and a piece of tin, all showing evidence of having been in the ears for a long time.

Causes of deaf-mutism given without the division in separate groups:

	Cases.
Spotted fever	43
Scarlet fever	66
Measles	17
Meningitis	29
Typhoid fever	5
Pneumonia	2
Diphtheria	2
Malaria	2
Smallpox	1
"Colds"	13
Convulsions	10
Black fever	3
Traumatism	9
Spinal meningitis	5
Inflammation of bowels	2
Cholera infantum	1
Shock	1
Mumps	1
Bronchitis	1
Catarrhal fever	1
Sunstroke	1
Otitis media	9
Whooping-cough	2
Teething	3
Croup	1
Eczema	1
Unknown (exclusive of 137 pupils credited as being deaf-mutes from birth)	49

HEREDITY.

The parents were relatives in 24 cases; deaf-mutes in 7. Pupils possessing other deaf-mute relatives, 94.

I would again call the reader's attention to the numbers composing each group: Group 1 (the sign-language pupils) being 303, Group 2 (the oral pupils) being 91, and Group 3 (the *oral failures*) being 21 in number.

Especial attention is called to these *oral failures*, and by glancing at the figures it will be observed that, in abnormalities of the post-nasal space, pharynx, and tonsils, this group is particularly rich. The difficulties for a deaf-mute, under the best circumstances, to acquire verbal language are sufficiently great to make a successful result seem almost like a miracle. With a post-nasal space stuffed by enlarged adenoids, the choanæ further occluded by posterior enlargement of the lower turbinated bodies, the tonsils so hypertrophied as to press upon the soft palate and tongue, and to greatly lessen the caliber of the fauces, it is not surprising that the would be deaf-mute speaker should become one of the army of "oral failures." I think that if these statistics show nothing else, they indicate the need for careful inspection of the entire vocal apparatus in all deaf-mutes entering upon oral training. They also show the necessity for such judicious treatment as will place the vocal apparatus of the pupil in the best condition for the various parts to perform their functions. I believe that many deaf-mute children have failed as oral pupils, or have not attained a satisfactory degree of ability in phonation, not because of mental inaptitude, or of neglect upon the part of their teachers, but purely because of anatomic defects that might have been corrected.

The large number of pupils showing the existence of plastic otitis media, but still having some sense of hearing by bone-conduction, suggests the possibility of benefit from modern operative methods.

The same suggestion would apply to cases of acquired deaf-mutism, in which bone-conduction was fairly good, and the lesion distinctly a sclerosis

of the middle ear or a necrotic process. These procedures would consist of excision of the useless drum-head with the malleus, now acting as obstructors to instead of conductors of vibrations, or of Urbantschitsch's or Miot's method of mobilization. Certainly, in a limited number of cases, it would be quite justifiable to perform the preliminary operation of making an ample perforation in the drum-head, and then be guided in regard to farther procedures by the results thus obtained.

The reader must not be misled into exaggerating the importance of certain data given in this report. I would refer, in this connection, chiefly to the subject of sclerosis of the pharyngeal mucous membrane. This appears as a very common condition in normal subjects, who are never conscious of any inconvenience therefrom. It is the degree of sclerosis in which the process borders upon true atrophy that renders it worthy of notice. However, it indicates the result of inflammation or malnutrition, and appears to me to be more advanced among the cases reported here than among normal children of the same age.

This report may serve as a partial answer to the question so often asked, why certain deaf mutes, of average mental capacity, either fail completely as speakers, or make sounds almost unintelligible, except to those long associated with them. In many instances, the causes may lie hidden deeply in some atrophied cerebral center, but it should certainly encourage the oral teacher to know that, in other cases—and, perhaps, a large proportion, too—the causes of failure are mechanical and within easy reach.